CLAIM AMENDMENTS

1-100 (cancelled)

101. (Previously Presented) A method of making a semiconductor chip assembly, comprising:

providing a metal base with first and second opposing surfaces; then

forming an etch mask on the first surface of the metal base;

forming a routing line on the second surface of the metal base; then

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar faces in a first direction, the second surface of the pillar faces in a second direction opposite the first direction, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line in the first direction, and the routing line extends laterally from the pillar towards the chip;

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant; and

forming a connection joint that electrically connects the routing line and the pad, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

102. (Previously Presented) The method of claim 101, wherein forming the routing line includes selectively depositing the routing line on the metal base.

103. (Previously Presented) The method of claim 101, wherein forming the routing line includes:

providing a plating mask on the metal base, wherein the plating mask includes an opening that exposes a portion of the metal base; and then

electroplating the routing line on the exposed portion of the metal base through the opening in the plating mask.

104. (Previously Presented) The method of claim 101, wherein forming the etch mask and the routing line includes simultaneously depositing the etch mask and the routing line on the metal base.

105. (Previously Presented) The method of claim 101, wherein forming the etch mask and the routing line includes:

providing a first plating mask on the metal base, wherein the first plating mask includes an opening that exposes a first portion of the metal base;

providing a second plating mask on the metal base, wherein the second plating mask includes an opening that exposes a second portion of the metal base; and then

simultaneously electroplating the etch mask on the first exposed portion of the metal base through the opening in the first plating mask and the routing line on the second exposed portion of the metal base through the opening in the second plating mask.

106. (Previously Presented) The method of claim 101, wherein etching the metal base etches through the metal base.

107. (Previously Presented) The method of claim 101, wherein etching the metal base exposes the routing line.

108. (Previously Presented) The method of claim 101, wherein etching the metal base reduces contact area between the metal base and the routing line.

109. (Previously Presented) The method of claim 101, wherein etching the metal base electrically isolates the routing line from other routing lines formed on the metal base.

110. (Previously Presented) The method of claim 101, wherein forming the encapsulant includes depositing the encapsulant on the pillar such that the encapsulant covers the pillar.

111. (Previously Presented) The method of claim 101, wherein forming the encapsulant includes depositing the encapsulant on the pillar such that the first surface of the pillar is exposed.

112. (Previously Presented) The method of claim 101, including removing a portion of the encapsulant thereby exposing the pillar.

113. (Previously Presented) The method of claim 112, wherein removing the portion of the encapsulant exposes the first surface of the pillar and laterally aligns the first surfaces of the encapsulant and the pillar with one another.

114. (Previously Presented) The method of claim 101, including removing a portion of the encapsulant thereby exposing the chip.

115. (Previously Presented) The method of claim 114, wherein removing the portion of the encapsulant exposes the second surface of the chip and laterally aligns the first surface of the encapsulant and the second surface of the chip with one another.

116. (Previously Presented) The method of claim 101, wherein forming the connection joint includes electroplating the connection joint on the routing line and the pad.

117. (Previously Presented) The method of claim 101, wherein forming the connection joint includes electrolessly plating the connection joint on the routing line and the pad.

118. (Previously Presented) The method of claim 101, wherein forming the connection joint includes depositing a non-solidified material on the routing line and the pad and then hardening the non-solidified material.

119. (Previously Presented) The method of claim 101, wherein forming the connection joint includes providing a wire bond that extends vertically beyond the chip and the routing line in the second direction.

120. (Previously Presented) The method of claim 101, wherein forming the connection joint occurs before forming the encapsulant.

121. (Previously Presented) The method of claim 101, wherein forming the connection joint occurs after forming the encapsulant.

122. (Previously Presented) The method of claim 101, wherein the first surface of the chip faces in the first direction after mechanically attaching the chip to the routing line and the pillar.

123. (Previously Presented) The method of claim 101, wherein the first surface of the chip faces in the second direction after mechanically attaching the chip to the routing line and the pillar.

124. (Previously Presented) The method of claim 101, wherein the routing line extends vertically beyond the chip in the second direction after mechanically attaching the chip to the routing line and the pillar.

125. (Previously Presented) The method of claim 101, wherein the routing line extends vertically beyond the pillar in the second direction after mechanically attaching the chip to the routing line and the pillar.

126. (Previously Presented) The method of claim 101, wherein the routing line extends within and outside the periphery of the chip after mechanically attaching the chip to the routing line and the pillar.

127. (Previously Presented) The method of claim 101, wherein the routing line is disposed outside the periphery of the chip after mechanically attaching the chip to the routing line and the pillar.

128. (Previously Presented) The method of claim 101, wherein the first surface of the pillar extends vertically beyond the chip in the first direction after mechanically attaching the chip to the routing line and the pillar.

129. (Previously Presented) The method of claim 101, wherein the second surface of the pillar extends vertically beyond the chip in the second direction after mechanically attaching the chip to the routing line and the pillar.

130. (Previously Presented) The method of claim 101, wherein the metal base is a copper plate.

131. (Previously Presented) The method of claim 101, wherein the routing line is an essentially planar metal lead.

132. (Previously Presented) The method of claim 101, wherein the pillar has a conical shape.

133. (Previously Presented) The method of claim 101, wherein the pillar is narrowest its first surface.

134. (Previously Presented) The method of claim 101, wherein the pillar is widest at its second surface.

135. (Previously Presented) The method of claim 101, wherein the pillar has tapered sidewalls that extend between its first and second surfaces and slant inwardly towards its first surface.

136. (Previously Presented) The method of claim 101, wherein the pillar has a first surface area at its first surface and a second surface area at its second surface, and the first surface area is at least 20 percent smaller than the second surface area.

137. (Previously Presented) The method of claim 101, including forming an insulative base that contacts the metal base and the routing line before forming the pillar, wherein the insulative base extends vertically beyond the chip, the routing line and the pillar in the second direction after mechanically attaching the chip to the routing line and the pillar.

138. (Previously Presented) The method of claim 137, including forming a through-hole that extends through the insulative base and exposes the pad, and then forming the connection joint.

139. (Previously Presented) The method of claim 101, including mechanically attaching the metal base and the routing line to a support before forming the pillar, and removing the support after forming the encapsulant.

140. (Previously Presented) The method of claim 139, including removing the support before forming the connection joint.

141. (Previously Presented) The method of claim 101, including mechanically attaching the chip to the routing line and the pillar using an insulative adhesive before forming the encapsulant.

142. (Previously Presented) The method of claim 141, including forming a through-hole that extends through the adhesive and exposes the pad, and then forming the connection joint.

143. (Previously Presented) The method of claim 142, wherein the adhesive contacts and is sandwiched between the routing line and the pad, and the routing line and the pad are electrically isolated from one another after forming the through-hole and before forming the connection joint.

144. (Previously Presented) The method of claim 101, including simultaneously forming the connection joint and a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint during a plating operation.

145. (Previously Presented) The method of claim 101, including simultaneously forming the connection joint and a second terminal that contacts the routing line, extends vertically beyond the routing line in the second direction and is spaced from the connection joint during a plating operation.

146. (Previously Presented) The method of claim 101, including simultaneously forming the connection joint, a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint, and a second terminal that contacts the routing line, extends vertically beyond the routing line in the second direction and is spaced from the connection joint and the first terminal during a plating operation.

147. (Previously Presented) The method of claim 146, including forming a first solder ball on the first terminal and a second solder ball on the second terminal.

148. (Previously Presented) The method of claim 101, including mechanically attaching a heat sink to the chip, the routing line, the pillar, the encapsulant and the connection joint, wherein the heat sink is electrically isolated from the chip, overlapped by the chip and disposed vertically beyond the chip in the second direction.

149. (Previously Presented) The method of claim 101, including mechanically attaching a ground plane to the chip, the routing line, the pillar, the encapsulant and the connection joint, and then electrically connecting the ground plane to the routing line, wherein the ground plane is overlapped by the routing line and disposed vertically beyond the routing line in the second direction.

150. (Previously Presented) The method of claim 101, wherein the assembly is devoid of wire bonds and TAB leads.

151. (Previously Presented) A method of making a semiconductor chip assembly, comprising:

providing a metal base with first and second opposing surfaces; then

forming an etch mask on the first surface of the metal base;

forming a routing line on the second surface of the metal base; then

etching the metal base, thereby etching through the metal base and reducing contact area between the metal base and the routing line, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar faces in a first direction, the second surface of the pillar faces in a second direction opposite the first direction, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and

extends vertically beyond the routing line in the first direction, and the routing line extends laterally from the pillar towards the chip;

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant; and

forming a connection joint that electrically connects the routing line and the pad, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

152. (Previously Presented) The method of claim 151, wherein forming the etch mask and the routing line includes simultaneously electroplating the etch mask and the routing line on the metal base.

153. (Previously Presented) The method of claim 151, wherein forming the etch mask and the routing line includes:

providing a first plating mask on the metal base, wherein the first plating mask includes an opening that exposes a first portion of the metal base;

providing a second plating mask on the metal base, wherein the second plating mask includes an opening that exposes a second portion of the metal base; and then

simultaneously electroplating the etch mask on the first exposed portion of the metal base through the opening in the first plating mask and the routing line on the second exposed portion of the metal base through the opening in the second plating mask.

154. (Previously Presented) The method of claim 153, wherein the first and second plating masks are photoresist.

155. (Previously Presented) The method of claim 151, wherein:

the etch mask includes first and second metal layers, the first metal layer of the etch mask contacts the first surface of the metal base and has a different composition than the metal base,

and the second metal layer of the etch mask contacts the first metal layer of the etch mask, has a different composition than the first metal layer of the etch mask and is spaced from the metal base; and

the routing line includes first and second metal layers, the first metal layer of the routing line contacts the second surface of the metal base and has a different composition than the metal base, and the second metal layer of the routing line contacts the first metal layer of the routing line, has a different composition than the first metal layer of the routing line and is spaced from the metal base.

156. (Previously Presented) The method of claim 155, wherein the metal base and the second metal layers have similar compositions.

157. (Previously Presented) The method of claim 156, wherein the metal base and the second metal layers are copper, and the first metal layers are nickel.

158. (Previously Presented) The method of claim 156, wherein etching the metal base includes applying a wet chemical etch that is highly selective of the metal base and the second metal layers with respect to the first metal layers, thereby forming the pillar, removing the second metal layer of the etch mask and exposing the first metal layer of the routing line without removing the second metal layer of the routing line.

159. (Previously Presented) The method of claim 158, including applying a second wet chemical etch after forming the pillar that is selective of the first metal layers, thereby removing the etch mask, removing an exposed portion of the first metal layer of the routing line and exposing the first surface of the pillar.

160. (Previously Presented) The method of claim 159, wherein applying the second wet chemical etch occurs before mechanically attaching the chip to the routing line and the pillar.

161. (Previously Presented) A method of making a semiconductor chip assembly, comprising:

providing a metal base with first and second opposing surfaces; then

forming an etch mask on the first surface of the metal base;

forming a routing line on the second surface of the metal base; then

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar faces in a first direction, the second surface of the pillar faces in a second direction opposite the first direction, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line in the first direction, and the routing line extends laterally from the pillar towards the chip;

forming an encapsulant that covers the chip, the routing line and the pillar and extends vertically beyond the chip, the routing line and the pillar in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant;

removing a portion of the encapsulant, thereby exposing the first surface of the pillar such that the chip and the pillar remain embedded in the encapsulant; and

forming a connection joint that electrically connects the routing line and the pad, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

162. (Previously Presented) The method of claim 161, wherein forming the encapsulant includes transfer molding the encapsulant.

163. (Previously Presented) The method of claim 161, wherein forming the encapsulant includes curing the encapsulant.

164. (Previously Presented) The method of claim 161, wherein removing the portion of the encapsulant includes applying a laser that ablates the encapsulant.

165. (Previously Presented) The method of claim 161, wherein removing the portion of the encapsulant includes applying a plasma that etches the encapsulant.

166. (Previously Presented) The method of claim 161, wherein removing the portion of the encapsulant includes grinding the encapsulant.

167. (Previously Presented) The method of claim 166, wherein removing the portion of the encapsulant includes grinding the encapsulant without grinding the pillar, and then grinding the encapsulant and the pillar, and excludes grinding the chip.

168. (Previously Presented) The method of claim 166, wherein removing the portion of the encapsulant includes grinding the encapsulant without grinding the pillar and without grinding the chip, and then grinding the encapsulant, the pillar and the chip.

169. (Previously Presented) The method of claim 168, wherein removing the portion of the encapsulant includes grinding the encapsulant without grinding the pillar and without grinding the chip, then grinding the encapsulant and the pillar without grinding the chip, and then grinding the encapsulant, the pillar and the chip.

170. (Previously Presented) The method of claim 168, wherein removing the portion of the encapsulant includes grinding the encapsulant without grinding the pillar and without grinding the chip, then grinding the encapsulant and the chip without grinding the pillar, and then grinding the encapsulant, the pillar and the chip.

171. (Previously Presented) A method of making a semiconductor chip assembly, comprising:

providing a metal base with first and second opposing surfaces; then

forming an etch mask on the first surface of the metal base;

forming a routing line on the second surface of the metal base;

mechanically attaching the metal base, the etch mask and the routing line to a support using an insulative base, wherein the insulative base contacts and is sandwiched between the metal base and the support, and between the routing line and the support; then

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar faces in a first direction, the second surface of the pillar faces in a second direction opposite the first direction, the chip overlaps the insulative base and the support and extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line in the first direction, the routing line extends laterally from the pillar towards the chip, the insulative base extends vertically beyond the chip, the routing line and the pillar in the second direction, and the support extends vertically beyond the insulative base in the second direction;

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant;

removing the support after forming the encapsulant; and

forming a connection joint that electrically connects the routing line and the pad, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

172. (Previously Presented) The method of claim 171, wherein mechanically attaching the metal base, the etch mask and the routing line to the support includes contacting the insulative base to the metal base and the routing line, then contacting the insulative base to the support, and then curing the insulative base.

173. (Previously Presented) The method of claim 171, wherein mechanically attaching the metal base, the etch mask and the routing line to the support includes contacting the insulative base to the support, then contacting the insulative base to the metal base and the routing line, and then curing the insulative base.

174. (Previously Presented) The method of claim 171, wherein mechanically attaching the chip to the routing line and the pillar includes using an insulative adhesive that contacts and is sandwiched between the chip and the insulative base.

175. (Previously Presented) The method of claim 171, wherein mechanically attaching the chip to the routing line and the pillar occurs after removing the etch mask.

176. (Previously Presented) The method of claim 171, wherein mechanically attaching the chip to the routing line and the pillar occurs while forming the connection joint.

177. (Previously Presented) The method of claim 171, wherein removing the support includes etching the support.

178. (Previously Presented) The method of claim 171, wherein removing the support includes peeling-off the support.

179. (Previously Presented) The method of claim 171, wherein removing the support occurs before forming the connection joint.

180. (Previously Presented) The method of claim 171, wherein removing the support occurs after forming the connection joint.

181. (Previously Presented) A method of making a semiconductor chip assembly, comprising:

providing a metal base with first and second opposing surfaces; then

forming an etch mask on the first surface of the metal base;

forming a routing line on the second surface of the metal base;

forming an insulative base that contacts the metal base and the routing line; then

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar using an insulative adhesive that contacts and is sandwiched between the chip and the insulative base, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar and the second surface of the chip face in a first direction, the first surface of the chip and the second surface of the pillar face in a second direction opposite the first direction, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line in the first direction, the routing line extends laterally from the pillar towards the chip, the adhesive extends vertically beyond the chip in the second direction, and the insulative base extends vertically beyond the adhesive in the second direction; then

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant; then

forming a through-hole that extends through the insulative base and the adhesive and exposes the pad; and then

forming a connection joint that electrically connects the routing line and the pad, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

182. (Previously Presented) The method of claim 181, wherein forming the through-hole includes applying a laser that ablates the insulative base and the adhesive.

183. (Previously Presented) The method of claim 181, wherein forming the through-hole includes applying a plasma that etches the insulative base and the adhesive.

184. (Previously Presented) The method of claim 181, wherein forming the through-hole exposes the routing line, and the connection joint contacts the routing line in the through-hole.

185. (Previously Presented) The method of claim 184, wherein forming the connection joint includes electroplating the connection joint on the routing line and the pad.

186. (Previously Presented) The method of claim 184, wherein forming the connection joint includes electrolessly plating the connection joint on the routing line and the pad.

187. (Previously Presented) The method of claim 184, wherein forming the connection joint includes depositing solder paste on the routing line and the pad and then reflowing the solder paste.

188. (Previously Presented) The method of claim 184, wherein forming the connection joint includes depositing conductive adhesive on the routing line and the pad and then curing the conductive adhesive.

189. (Previously Presented) The method of claim 181, wherein forming the through-hole does not expose the routing line, and the connection joint does not contact the routing line in the through-hole.

190. (Previously Presented) The method of claim 189, wherein forming the connection joint includes providing a wire bond that extends into and is electrically connected to the pad in the through-hole, and extends out of and is electrically connected to the routing line outside the through-hole.

191. (Previously Presented) A method of making a semiconductor chip assembly, comprising:

providing a metal base with first and second opposing surfaces; then

forming an etch mask on the first surface of the metal base;

forming a routing line on the second surface of the metal base; then

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar faces in a first direction, the second surface of the pillar faces in a second direction opposite the first direction, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line in the first direction, and the routing line extends laterally from the pillar towards the chip; then

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant; and then

forming a connection joint that contacts and electrically connects the routing line and the pad and a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint during a plating operation,

wherein a conductive trace that includes the routing line, the pillar and the first terminal is electrically connected to the pad and extends through the first surface of the encapsulant.

192. (Previously Presented) The method of claim 191, wherein forming the connection joint and the first terminal includes simultaneously forming the connection joint and the first terminal during the plating operation.

193. (Previously Presented) The method of claim 191, wherein forming the connection joint and the first terminal includes forming a second terminal that contacts the routing line, extends vertically beyond the routing line in the second direction and is spaced from the connection joint and the first terminal during the plating operation.

194. (Previously Presented) The method of claim 193, wherein forming the connection joint and the first and second terminals includes simultaneously forming the connection joint and the first and second terminals during the plating operation.

195. (Previously Presented) The method of claim 193, wherein the first and second terminals are vertically aligned with one another.

196. (Previously Presented) The method of claim 193, wherein the first and second terminals are not vertically aligned with one another.

197. (Previously Presented) The method of claim 191, wherein the first surfaces of the pillar and the encapsulant are laterally aligned with one another, and the first terminal extends vertically beyond the encapsulant in the first direction.

198. (Previously Presented) The method of claim 193, wherein the second terminal extends vertically beyond the encapsulant in the second direction.

199. (Previously Presented) The method of claim 191, including forming a first solder ball on the first terminal.

200. (Previously Presented) The method of claim 193, including forming a first solder ball on the first terminal and a second solder ball on the second terminal.

201. (Previously Presented) A method of making a semiconductor chip assembly, comprising:

providing a metal base;

forming a routing line on the metal base;

etching the metal base, wherein an unetched portion of the metal base forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar faces in a first direction, the second surface of the pillar faces in a second direction opposite the first direction, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line in the first direction, and the routing line extends laterally from the pillar towards the chip;

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant; and

forming a connection joint that electrically connects the routing line and the pad, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

202. (Previously Presented) The method of claim 201, wherein forming an etch mask and the routing line includes:

providing a first plating mask on the metal base, wherein the first plating mask includes an opening that exposes a first portion of the metal base;

providing a second plating mask on the metal base, wherein the second plating mask includes an opening that exposes a second portion of the metal base; and then

simultaneously electroplating the etch mask on the first exposed portion of the metal base through the opening in the first plating mask and the routing line on the second exposed portion of the metal base through the opening in the second plating mask.

203. (Previously Presented) The method of claim 201, wherein etching the metal base etches through the metal base, reduces contact area between the metal base and the routing line, exposes the routing line and electrically isolates the routing line from other routing lines formed on the metal base.

204. (Previously Presented) The method of claim 201, wherein mechanically attaching the chip to the routing line and the pillar provides that the routing line extends within and outside a periphery of the chip and is disposed vertically beyond the chip in the second direction.

205. (Previously Presented) The method of claim 201, wherein mechanically attaching the chip to the routing line and the pillar provides that the routing line is disposed outside the periphery of the chip and vertically beyond the chip in the second direction.

206. (Previously Presented) The method of claim 201, wherein mechanically attaching the chip to the routing line and the pillar provides that the first surface of the pillar extends vertically beyond the chip in the first direction.

207. (Previously Presented) The method of claim 201, wherein mechanically attaching the chip to the routing line and the pillar provides that the second surface of the pillar extends vertically beyond the chip in the second direction.

208. (Previously Presented) The method of claim 201, wherein forming the encapsulant includes depositing the encapsulant on and in contact with the chip and the pillar.

209. (Previously Presented) The method of claim 201, wherein forming the encapsulant includes depositing the encapsulant such that the encapsulant covers the first surface of the pillar, and after depositing the encapsulant, the method includes grinding the first surface of the encapsulant without grinding the pillar, and then grinding the first surfaces of the pillar and the encapsulant such that the first surfaces of the pillar and the encapsulant are laterally aligned with one another.

210. (Previously Presented) The method of claim 201, wherein forming the encapsulant includes depositing the encapsulant such that the encapsulant does not cover the first surface of the pillar.

211. (Previously Presented) The method of claim 201, wherein forming the connection joint occurs after forming the encapsulant.

212. (Previously Presented) The method of claim 201, wherein forming the connection joint occurs after forming the encapsulant and removing a portion of the encapsulant to expose the first surface of the pillar.

213. (Previously Presented) The method of claim 201, wherein forming the connection joint includes plating the connection joint on the routing line and the pad during a plating operation.

214. (Previously Presented) The method of claim 213, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint during the plating operation.

215. (Previously Presented) The method of claim 214, including forming a second terminal that contacts the routing line, extends vertically beyond the routing line in the second direction and is spaced from the connection joint and the first terminal during the plating operation.

216. (Previously Presented) The method of claim 201, wherein the routing line is an essentially flat planar lead, and the pillar has tapered sidewalls that extend between its first and second surfaces and extend inwardly towards its first surface.

217. (Previously Presented) The method of claim 201, including mechanically attaching a heat sink to the chip, the routing line, the pillar, the encapsulant and the connection joint, wherein the heat sink is electrically isolated from the chip, overlapped by the chip and disposed vertically beyond the chip in the second direction.

218. (Previously Presented) The method of claim 217, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint and a metallic coating that contacts the heat sink, extends vertically beyond the heat sink in the second direction and is spaced from the first terminal and the connection joint during a plating operation.

219. (Previously Presented) The method of claim 201, including mechanically attaching a ground plane to the chip, the routing line, the pillar, the encapsulant and the connection joint, and then electrically connecting the ground plane to the routing line, wherein the ground plane is overlapped by the routing line and disposed vertically beyond the routing line in the second direction.

220. (Previously Presented) The method of claim 219, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint and a metallic coating that contacts and electrically connects the routing line and the ground plane, extends vertically beyond the ground

plane in the second direction and is spaced from the first terminal and the connection joint during a plating operation.

221. (Currently Amended) A method of making a semiconductor chip assembly, comprising the following steps in the sequence set forth:

providing a metal base, an etch mask and a routing line, wherein the metal base includes ~~with~~ first and second opposing surfaces, the ;

~~forming an~~ etch mask is formed on the first surface of the metal base and the~~a~~ routing line is formed on the second surface of the metal base;

mechanically attaching the metal base, the etch mask and the routing line to a support using an insulative base that extends between the metal base and the support, and between the routing line and the support;

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line;

mechanically attaching a semiconductor chip to the routing line and the pillar using an adhesive that extends between the chip and the insulative base, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar and the second surface of the chip face in a first direction, the first surface of the chip and the second surface of the pillar face in a second direction opposite the first direction, the chip, the routing line and the pillar overlap the insulative base and the support, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line and the first surface of the chip in the first direction, the routing line extends laterally from the pillar towards the chip and extends within and outside the periphery of the chip, the insulative base extends vertically beyond the chip, the routing line and the pillar in the second direction, and the support extends vertically beyond the insulative base in the second direction;

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in

the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant;

removing the support;

forming a through-hole that extends through the insulative base and the adhesive and exposes the routing line and the pad; and

forming a connection joint that electrically connects the routing line and the pad in the through-hole, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

222. (Previously Presented) The method of claim 221, wherein forming the etch mask and the routing line includes:

providing a first plating mask on the metal base, wherein the first plating mask includes an opening that exposes a first portion of the metal base;

providing a second plating mask on the metal base, wherein the second plating mask includes an opening that exposes a second portion of the metal base; and then

simultaneously electroplating the etch mask on the first exposed portion of the metal base through the opening in the first plating mask and the routing line on the second exposed portion of the metal base through the opening in the second plating mask.

223. (Previously Presented) The method of claim 221, wherein etching the metal base etches through the metal base, reduces contact area between the metal base and the routing line, exposes the routing line and electrically isolates the routing line from other routing lines formed on the metal base.

224. (Previously Presented) The method of claim 221, wherein mechanically attaching the chip to the routing line and the pillar provides that the first surface of the pillar extends vertically beyond the chip in the first direction.

225. (Previously Presented) The method of claim 221, wherein mechanically attaching the chip to the routing line and the pillar provides that the second surface of the pillar extends vertically beyond the chip in the second direction.

226. (Previously Presented) The method of claim 221, wherein removing the support includes etching the support.

227. (Previously Presented) The method of claim 221, wherein removing the support includes peeling-off the support.

228. (Previously Presented) The method of claim 221, wherein forming the encapsulant includes depositing the encapsulant on and in contact with the chip, the pillar and the insulative base.

229. (Previously Presented) The method of claim 221, wherein forming the encapsulant includes depositing the encapsulant such that the encapsulant covers the first surface of the pillar, and after depositing the encapsulant, the method includes grinding the first surface of the encapsulant without grinding the pillar, and then grinding the first surfaces of the pillar and the encapsulant such that the first surfaces of the pillar and the encapsulant are laterally aligned with one another.

230. (Previously Presented) The method of claim 221, wherein forming the encapsulant includes depositing the encapsulant such that the encapsulant does not cover the first surface of the pillar.

231. (Previously Presented) The method of claim 221, wherein forming the through-hole includes applying a laser that ablates the insulative base and the adhesive.

232. (Previously Presented) The method of claim 221, wherein forming the through-hole includes applying a plasma that etches the insulative base and the adhesive.

233. (Previously Presented) The method of claim 221, wherein forming the connection joint includes plating the connection joint on the routing line and the pad during a plating operation.

234. (Previously Presented) The method of claim 233, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint during the plating operation.

235. (Previously Presented) The method of claim 234, including forming a second terminal that contacts the routing line, extends vertically beyond the routing line in the second direction and is spaced from the connection joint and the first terminal during the plating operation.

236. (Previously Presented) The method of claim 221, wherein the routing line is an essentially flat planar lead, and the pillar has tapered sidewalls that extend between its first and second surfaces and extend inwardly towards its first surface.

237. (Previously Presented) The method of claim 221, including mechanically attaching a heat sink to the insulative base after removing the support, wherein the heat sink is electrically isolated from the chip, overlapped by the chip and disposed vertically beyond the insulative base the second direction.

238. (Previously Presented) The method of claim 237, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint and a metallic coating that contacts the heat sink, extends vertically beyond the heat sink in the second direction and is spaced from the first terminal and the connection joint during a plating operation.

239. (Previously Presented) The method of claim 221, including mechanically attaching a ground plane to the insulative base after removing the support, and then electrically connecting the ground plane to the routing line, wherein the ground plane is overlapped by the routing line and disposed vertically beyond the insulative base in the second direction.

240. (Previously Presented) The method of claim 239, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint and a metallic coating that contacts and electrically connects the routing line and the ground plane, extends through the insulative base, extends vertically beyond the ground plane in the second direction and is spaced from the first terminal and the connection joint during a plating operation.

241. (Currently Amended) A method of making a semiconductor chip assembly, comprising the following steps in the sequence set forth:

providing a metal base, an etch mask and a routing line, wherein the metal base includes ~~with~~ first and second opposing surfaces, the~~;~~

~~forming an~~ etch mask is formed on the first surface of the metal base and the~~a~~ routing line is formed on the second surface of the metal base;

mechanically attaching the metal base, the etch mask and the routing line to a support using an insulative base that extends between the metal base and the support, and between the routing line and the support;

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line;

mechanically attaching a semiconductor chip to the routing line and the pillar, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar and the second surface of the chip face in a first direction, the first surface of the chip and the second surface of the pillar face in a second direction opposite the first direction, the chip, the routing line and the pillar overlap the insulative

base and the support, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line and the first surface of the chip in the first direction, the routing line extends laterally from the pillar towards the chip and extends within and outside a periphery of the chip, the insulative base extends vertically beyond the chip, the routing line and the pillar in the second direction, the support extends vertically beyond the insulative base in the second direction, and a connection joint electrically connects the routing line and the pad;

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant; and

removing the support, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

242. (Previously Presented) The method of claim 241, wherein forming the etch mask and the routing line includes:

providing a first plating mask on the metal base, wherein the first plating mask includes an opening that exposes a first portion of the metal base;

providing a second plating mask on the metal base, wherein the second plating mask includes an opening that exposes a second portion of the metal base; and then

simultaneously electroplating the etch mask on the first exposed portion of the metal base through the opening in the first plating mask and the routing line on the second exposed portion of the metal base through the opening in the second plating mask.

243. (Previously Presented) The method of claim 241, wherein etching the metal base etches through the metal base, reduces contact area between the metal base and the routing line, exposes the routing line and electrically isolates the routing line from other routing lines formed on the metal base.

244. (Previously Presented) The method of claim 241, wherein mechanically attaching the chip to the routing line and the pillar provides that the first surface of the pillar extends vertically beyond the chip in the first direction.

245. (Previously Presented) The method of claim 241, wherein mechanically attaching the chip to the routing line and the pillar provides that the second surface of the pillar extends vertically beyond the chip in the second direction.

246. (Previously Presented) The method of claim 241, wherein removing the support includes etching the support.

247. (Previously Presented) The method of claim 241, wherein removing the support includes peeling-off the support.

248. (Previously Presented) The method of claim 241, wherein forming the encapsulant includes depositing the encapsulant on and in contact with the chip, the pillar and the insulative base.

249. (Previously Presented) The method of claim 241, wherein forming the encapsulant includes depositing the encapsulant such that the encapsulant covers the first surface of the pillar, and after depositing the encapsulant, the method includes grinding the first surface of the encapsulant without grinding the pillar, and then grinding the first surfaces of the pillar and the encapsulant such that the first surfaces of the pillar and the encapsulant are laterally aligned with one another.

250. (Previously Presented) The method of claim 241, wherein forming the encapsulant includes depositing the encapsulant such that the encapsulant does not cover the first surface of the pillar.

251. (Previously Presented) The method of claim 241, including forming a through-hole that extends through the insulative base and exposes the routing line after removing the support.

252. (Previously Presented) The method of claim 251, wherein forming the through-hole includes applying a laser that ablates the insulative base.

253. (Previously Presented) The method of claim 251, wherein forming the through-hole includes applying a plasma that etches the insulative base.

254. (Previously Presented) The method of claim 251, including forming a second terminal that contacts the routing line in the through-hole, extends vertically beyond the routing line in the second direction and is spaced from the connection joint during a plating operation.

255. (Previously Presented) The method of claim 254, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint and the second terminal during the plating operation.

256. (Previously Presented) The method of claim 241, wherein the routing line is an essentially flat planar lead, and the pillar has tapered sidewalls that extend between its first and second surfaces and extend inwardly towards its first surface.

257. (Previously Presented) The method of claim 241, including mechanically attaching a heat sink to the insulative base after removing the support, wherein the heat sink is electrically isolated from the chip, overlapped by the chip and disposed vertically beyond the insulative base the second direction.

258. (Previously Presented) The method of claim 257, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint and a metallic coating that contacts the heat

sink, extends vertically beyond the heat sink in the second direction and is spaced from the first terminal and the connection joint during a plating operation.

259. (Previously Presented) The method of claim 241, including mechanically attaching a ground plane to the insulative base after removing the support, and then electrically connecting the ground plane to the routing line, wherein the ground plane is overlapped by the routing line and disposed vertically beyond the insulative base in the second direction.

260. (Previously Presented) The method of claim 259, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint and a metallic coating that contacts and electrically connects the routing line and the ground plane, extends through the insulative base, extends vertically beyond the ground plane in the second direction and is spaced from the first terminal and the connection joint during a plating operation.

261. (Currently Amended) A method of making a semiconductor chip assembly, comprising the following steps in the sequence set forth:

providing a metal base, an etch mask and a routing line, wherein the metal base includes ~~with~~ first and second opposing surfaces, the;

~~forming an~~ etch mask is formed on the first surface of the metal base and ~~the~~a routing line is formed on the second surface of the metal base;

mechanically attaching the metal base, the etch mask and the routing line to a support using an insulative base that extends between the metal base and the support, and between the routing line and the support;

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line;

mechanically attaching a semiconductor chip to the routing line and the pillar using an adhesive that extends between the chip and the insulative base, wherein the chip includes first

and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar and the second surface of the chip face in a first direction, the first surface of the chip and the second surface of the pillar face in a second direction opposite the first direction, the chip, the routing line and the pillar overlap the insulative base and the support, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line and the first surface of the chip in the first direction, the routing line extends laterally from the pillar towards the chip, the insulative base extends vertically beyond the chip, the routing line and the pillar in the second direction, and the support extends vertically beyond the insulative base in the second direction;

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant;

removing the support;

forming a first through-hole that extends through the insulative base and exposes the routing line without exposing the pad and a second through-hole that extends through the insulative base and the adhesive and exposes the pad without exposing the routing line; and

forming a wire bond connection joint that electrically connects the routing line and the pad, wherein the connection joint is electrically connected to the routing line in the first through-hole and the pad in the second through-hole, the connection joint extends vertically beyond the insulative base in the second direction, and a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

262. (Previously Presented) The method of claim 261, wherein forming the etch mask and the routing line includes:

providing a first plating mask on the metal base, wherein the first plating mask includes an opening that exposes a first portion of the metal base;

providing a second plating mask on the metal base, wherein the second plating mask includes an opening that exposes a second portion of the metal base; and then

simultaneously electroplating the etch mask on the first exposed portion of the metal base through the opening in the first plating mask and the routing line on the second exposed portion of the metal base through the opening in the second plating mask.

263. (Previously Presented) The method of claim 261, wherein etching the metal base etches through the metal base, reduces contact area between the metal base and the routing line, exposes the routing line and electrically isolates the routing line from other routing lines formed on the metal base.

264. (Previously Presented) The method of claim 261, wherein mechanically attaching the chip to the routing line and the pillar provides that the first surface of the pillar extends vertically beyond the chip in the first direction.

265. (Previously Presented) The method of claim 261, wherein mechanically attaching the chip to the routing line and the pillar provides that the second surface of the pillar extends vertically beyond the chip in the second direction.

266. (Previously Presented) The method of claim 261, wherein removing the support includes etching the support.

267. (Previously Presented) The method of claim 261, wherein removing the support includes peeling-off the support.

268. (Previously Presented) The method of claim 261, wherein forming the encapsulant includes depositing the encapsulant on and in contact with the chip, the pillar and the insulative base.

269. (Previously Presented) The method of claim 261, wherein forming the encapsulant includes depositing the encapsulant such that the encapsulant covers the first surface of the pillar, and after depositing the encapsulant, the method includes grinding the first surface of the

encapsulant without grinding the pillar, and then grinding the first surfaces of the pillar and the encapsulant such that the first surfaces of the pillar and the encapsulant are laterally aligned with one another.

270. (Previously Presented) The method of claim 261, wherein forming the encapsulant includes depositing the encapsulant such that the encapsulant does not cover the first surface of the pillar.

271. (Previously Presented) The method of claim 261, wherein forming the first through-hole includes applying a laser that ablates the insulative base, and forming the second through-hole includes applying a laser that ablates the insulative base and the adhesive.

272. (Previously Presented) The method of claim 261, wherein forming the first through-hole includes applying a plasma that etches the insulative base, and forming the second through-hole includes applying a plasma that etches the insulative base and the adhesive.

273. (Previously Presented) The method of claim 261, wherein forming the first and second through-holes includes forming the first and second through-holes in sequence.

274. (Previously Presented) The method of claim 261, including forming a second terminal that contacts the routing line in the first through-hole and extends vertically beyond the routing line in the second direction during a plating operation, and then forming the connection joint on the second terminal.

275. (Previously Presented) The method of claim 274, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the second terminal during the plating operation.

276. (Previously Presented) The method of claim 261, wherein the routing line is an essentially flat planar lead, and the pillar has tapered sidewalls that extend between its first and second surfaces and extend inwardly towards its first surface.

277. (Previously Presented) The method of claim 261, including mechanically attaching a heat sink to the insulative base after removing the support, wherein the heat sink is electrically isolated from the chip, overlapped by the chip and disposed vertically beyond the insulative base the second direction.

278. (Previously Presented) The method of claim 277, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint and a metallic coating that contacts the heat sink, extends vertically beyond the heat sink in the second direction and is spaced from the first terminal and the connection joint during a plating operation.

279. (Previously Presented) The method of claim 261, including mechanically attaching a ground plane to the insulative base after removing the support, and then electrically connecting the ground plane to the routing line, wherein the ground plane is overlapped by the routing line and disposed vertically beyond the insulative base in the second direction.

280. (Previously Presented) The method of claim 279, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint and a metallic coating that contacts and electrically connects the routing line and the ground plane, extends through the insulative base, extends vertically beyond the ground plane in the second direction and is spaced from the first terminal and the connection joint during a plating operation.

281. (Currently Amended) A method of making a semiconductor chip assembly, comprising the following steps in the sequence set forth:

providing a metal base, an etch mask and a routing line, wherein the metal base includes ~~with~~ first and second opposing surfaces, the~~;~~

~~forming an~~ etch mask is formed on the first surface of the metal base and the~~a~~ routing line is formed on the second surface of the metal base;

mechanically attaching the metal base, the etch mask and the routing line to a support using an insulative base that extends between the metal base and the support, and between the routing line and the support;

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line;

mechanically attaching a semiconductor chip to the routing line and the pillar using an adhesive that extends between the chip and the insulative base, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surfaces of the chip and the pillar face in a first direction, the second surfaces of the chip and the pillar face in a second direction opposite the first direction, the chip, the routing line and the pillar overlap the insulative base and the support, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line and the second surface of the chip in the first direction, the routing line extends laterally from the pillar towards the chip, the insulative base extends vertically beyond the chip, the routing line and the pillar in the second direction, and the support extends vertically beyond the insulative base in the second direction;

forming a wire bond connection joint that electrically connects the routing line and the pad;

forming an encapsulant that covers the chip and the connection joint and extends vertically beyond the chip, the routing line and the connection joint in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant; and

removing the support, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

282. (Previously Presented) The method of claim 281, wherein forming the etch mask and the routing line includes:

providing a first plating mask on the metal base, wherein the first plating mask includes an opening that exposes a first portion of the metal base;

providing a second plating mask on the metal base, wherein the second plating mask includes an opening that exposes a second portion of the metal base; and then

simultaneously electroplating the etch mask on the first exposed portion of the metal base through the opening in the first plating mask and the routing line on the second exposed portion of the metal base through the opening in the second plating mask.

283. (Previously Presented) The method of claim 281, wherein etching the metal base etches through the metal base, reduces contact area between the metal base and the routing line, exposes the routing line and electrically isolates the routing line from other routing lines formed on the metal base.

284. (Previously Presented) The method of claim 281, wherein mechanically attaching the chip to the routing line and the pillar provides that the first surface of the pillar extends vertically beyond the chip in the first direction.

285. (Previously Presented) The method of claim 281, wherein mechanically attaching the chip to the routing line and the pillar provides that the second surface of the pillar extends vertically beyond the chip in the second direction.

286. (Previously Presented) The method of claim 281, wherein removing the support includes etching the support.

287. (Previously Presented) The method of claim 281, wherein removing the support includes peeling-off the support.

288. (Previously Presented) The method of claim 281, wherein forming the encapsulant includes depositing the encapsulant on and in contact with the chip, the insulative base and the connection joint.

289. (Previously Presented) The method of claim 281, wherein forming the encapsulant includes depositing the encapsulant such that the encapsulant covers the first surface of the pillar, and after depositing the encapsulant, the method includes grinding the first surface of the encapsulant without grinding the pillar, and then grinding the first surfaces of the pillar and the encapsulant such that the first surfaces of the pillar and the encapsulant are laterally aligned with one another.

290. (Previously Presented) The method of claim 281, wherein forming the encapsulant includes depositing the encapsulant such that the encapsulant does not cover the first surface of the pillar.

291. (Previously Presented) The method of claim 281, including forming a through-hole that extends through the insulative base and exposes the routing line after removing the support.

292. (Previously Presented) The method of claim 291, wherein forming the through-hole includes applying a laser that ablates the insulative base.

293. (Previously Presented) The method of claim 291, wherein forming the through-hole includes applying a plasma that etches the insulative base.

294. (Previously Presented) The method of claim 291, including forming a second terminal that contacts the routing line in the through-hole, extends vertically beyond the routing line in the second direction and is spaced from the connection joint during a plating operation.

295. (Previously Presented) The method of claim 294, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first

direction and is spaced from the connection joint and the second terminal during the plating operation.

296. (Previously Presented) The method of claim 281, wherein the routing line is an essentially flat planar lead, and the pillar has tapered sidewalls that extend between its first and second surfaces and extend inwardly towards its first surface.

297. (Previously Presented) The method of claim 281, including mechanically attaching a heat sink to the insulative base after removing the support, wherein the heat sink is electrically isolated from the chip, overlapped by the chip and disposed vertically beyond the insulative base the second direction.

298. (Previously Presented) The method of claim 297, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint and a metallic coating that contacts the heat sink, extends vertically beyond the heat sink in the second direction and is spaced from the first terminal and the connection joint during a plating operation.

299. (Previously Presented) The method of claim 281, including mechanically attaching a ground plane to the insulative base after removing the support, and then electrically connecting the ground plane to the routing line, wherein the ground plane is overlapped by the routing line and disposed vertically beyond the insulative base in the second direction.

300. (Previously Presented) The method of claim 299, including forming a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint and a metallic coating that contacts and electrically connects the routing line and the ground plane, extends through the insulative base, extends vertically beyond the ground plane in the second direction and is spaced from the first terminal and the connection joint during a plating operation.

301. (New) A method of making a semiconductor chip assembly, comprising:

providing a metal base, an etch mask and a routing line, wherein the metal base includes first and second opposing surfaces, the etch mask is formed on the first surface of the metal base and the routing line is formed on the second surface of the metal base; then

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar faces in a first direction, the second surface of the pillar faces in a second direction opposite the first direction, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line in the first direction, and the routing line extends laterally from the pillar towards the chip;

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant; and

forming a connection joint that electrically connects the routing line and the pad, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

302. (New) The method of claim 301, wherein forming the routing line includes selectively depositing the routing line on the metal base.

303. (New) The method of claim 301, wherein forming the routing line includes:

providing a plating mask on the metal base, wherein the plating mask includes an opening that exposes a portion of the metal base; and then

electroplating the routing line on the exposed portion of the metal base through the opening in the plating mask.

304. (New) The method of claim 301, wherein forming the etch mask and the routing line includes simultaneously depositing the etch mask and the routing line on the metal base.

305. (New) The method of claim 301, wherein forming the etch mask and the routing line includes:

providing a first plating mask on the metal base, wherein the first plating mask includes an opening that exposes a first portion of the metal base;

providing a second plating mask on the metal base, wherein the second plating mask includes an opening that exposes a second portion of the metal base; and then

simultaneously electroplating the etch mask on the first exposed portion of the metal base through the opening in the first plating mask and the routing line on the second exposed portion of the metal base through the opening in the second plating mask.

306. (New) The method of claim 301, wherein etching the metal base etches through the metal base.

307. (New) The method of claim 301, wherein etching the metal base exposes the routing line.

308. (New) The method of claim 301, wherein etching the metal base reduces contact area between the metal base and the routing line.

309. (New) The method of claim 301, wherein etching the metal base electrically isolates the routing line from other routing lines formed on the metal base.

310. (New) The method of claim 301, wherein forming the encapsulant includes depositing the encapsulant on the pillar such that the encapsulant covers the pillar.

311. (New) The method of claim 301, wherein forming the encapsulant includes depositing the encapsulant on the pillar such that the first surface of the pillar is exposed.

312. (New) The method of claim 301, including removing a portion of the encapsulant thereby exposing the pillar.

313. (New) The method of claim 312, wherein removing the portion of the encapsulant exposes the first surface of the pillar and laterally aligns the first surfaces of the encapsulant and the pillar with one another.

314. (New) The method of claim 301, including removing a portion of the encapsulant thereby exposing the chip.

315. (New) The method of claim 314, wherein removing the portion of the encapsulant exposes the second surface of the chip and laterally aligns the first surface of the encapsulant and the second surface of the chip with one another.

316. (New) The method of claim 301, wherein forming the connection joint includes electroplating the connection joint on the routing line and the pad.

317. (New) The method of claim 301, wherein forming the connection joint includes electrolessly plating the connection joint on the routing line and the pad.

318. (New) The method of claim 301, wherein forming the connection joint includes depositing a non-solidified material on the routing line and the pad and then hardening the non-solidified material.

319. (New) The method of claim 301, wherein forming the connection joint includes providing a wire bond that extends vertically beyond the chip and the routing line in the second direction.

320. (New) The method of claim 301, wherein forming the connection joint occurs before forming the encapsulant.

321. (New) The method of claim 301, wherein forming the connection joint occurs after forming the encapsulant.

322. (New) The method of claim 301, wherein the first surface of the chip faces in the first direction after mechanically attaching the chip to the routing line and the pillar.

323. (New) The method of claim 301, wherein the first surface of the chip faces in the second direction after mechanically attaching the chip to the routing line and the pillar.

324. (New) The method of claim 301, wherein the routing line extends vertically beyond the chip in the second direction after mechanically attaching the chip to the routing line and the pillar.

325. (New) The method of claim 301, wherein the routing line extends vertically beyond the pillar in the second direction after mechanically attaching the chip to the routing line and the pillar.

326. (New) The method of claim 301, wherein the routing line extends within and outside the periphery of the chip after mechanically attaching the chip to the routing line and the pillar.

327. (New) The method of claim 301, wherein the routing line is disposed outside the periphery of the chip after mechanically attaching the chip to the routing line and the pillar.

328. (New) The method of claim 301, wherein the first surface of the pillar extends vertically beyond the chip in the first direction after mechanically attaching the chip to the routing line and the pillar.

329. (New) The method of claim 301, wherein the second surface of the pillar extends vertically beyond the chip in the second direction after mechanically attaching the chip to the routing line and the pillar.

330. (New) The method of claim 301, wherein the metal base is a copper plate.

331. (New) The method of claim 301, wherein the routing line is an essentially planar metal lead.

332. (New) The method of claim 301, wherein the pillar has a conical shape.

333. (New) The method of claim 301, wherein the pillar is narrowest its first surface.

334. (New) The method of claim 301, wherein the pillar is widest at its second surface.

335. (New) The method of claim 301, wherein the pillar has tapered sidewalls that extend between its first and second surfaces and slant inwardly towards its first surface.

336. (New) The method of claim 301, wherein the pillar has a first surface area at its first surface and a second surface area at its second surface, and the first surface area is at least 20 percent smaller than the second surface area.

337. (New) The method of claim 301, including forming an insulative base that contacts the metal base and the routing line before forming the pillar, wherein the insulative base extends vertically beyond the chip, the routing line and the pillar in the second direction after mechanically attaching the chip to the routing line and the pillar.

338. (New) The method of claim 337, including forming a through-hole that extends through the insulative base and exposes the pad, and then forming the connection joint.

339. (New) The method of claim 301, including mechanically attaching the metal base and the routing line to a support before forming the pillar, and removing the support after forming the encapsulant.

340. (New) The method of claim 339, including removing the support before forming the connection joint.

341. (New) The method of claim 301, including mechanically attaching the chip to the routing line and the pillar using an insulative adhesive before forming the encapsulant.

342. (New) The method of claim 341, including forming a through-hole that extends through the adhesive and exposes the pad, and then forming the connection joint.

343. (New) The method of claim 342, wherein the adhesive contacts and is sandwiched between the routing line and the pad, and the routing line and the pad are electrically isolated from one another after forming the through-hole and before forming the connection joint.

344. (New) The method of claim 301, including simultaneously forming the connection joint and a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint during a plating operation.

345. (New) The method of claim 301, including simultaneously forming the connection joint and a second terminal that contacts the routing line, extends vertically beyond the routing line in the second direction and is spaced from the connection joint during a plating operation.

346. (New) The method of claim 301, including simultaneously forming the connection joint, a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint, and a second terminal that contacts the routing line, extends vertically beyond the routing line in the second direction and is spaced from the connection joint and the first terminal during a plating operation.

347. (New) The method of claim 346, including forming a first solder ball on the first terminal and a second solder ball on the second terminal.

348. (New) The method of claim 301, including mechanically attaching a heat sink to the chip, the routing line, the pillar, the encapsulant and the connection joint, wherein the heat sink is electrically isolated from the chip, overlapped by the chip and disposed vertically beyond the chip in the second direction.

349. (New) The method of claim 301, including mechanically attaching a ground plane to the chip, the routing line, the pillar, the encapsulant and the connection joint, and then electrically connecting the ground plane to the routing line, wherein the ground plane is overlapped by the routing line and disposed vertically beyond the routing line in the second direction.

350. (New) The method of claim 301, wherein the assembly is devoid of wire bonds and TAB leads.

351. (New) A method of making a semiconductor chip assembly, comprising:

providing a metal base, an etch mask and a routing line, wherein the metal base includes first and second opposing surfaces, the etch mask is formed on the first surface of the metal base and the routing line is formed on the second surface of the metal base; then

etching the metal base, thereby etching through the metal base and reducing contact area between the metal base and the routing line, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first

surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar faces in a first direction, the second surface of the pillar faces in a second direction opposite the first direction, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line in the first direction, and the routing line extends laterally from the pillar towards the chip;

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant; and

forming a connection joint that electrically connects the routing line and the pad, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

352. (New) The method of claim 351, wherein forming the etch mask and the routing line includes simultaneously electroplating the etch mask and the routing line on the metal base.

353. (New) The method of claim 351, wherein forming the etch mask and the routing line includes:

providing a first plating mask on the metal base, wherein the first plating mask includes an opening that exposes a first portion of the metal base;

providing a second plating mask on the metal base, wherein the second plating mask includes an opening that exposes a second portion of the metal base; and then

simultaneously electroplating the etch mask on the first exposed portion of the metal base through the opening in the first plating mask and the routing line on the second exposed portion of the metal base through the opening in the second plating mask.

354. (New) The method of claim 353, wherein the first and second plating masks are photoresist.

355. (New) The method of claim 351, wherein:

the etch mask includes first and second metal layers, the first metal layer of the etch mask contacts the first surface of the metal base and has a different composition than the metal base, and the second metal layer of the etch mask contacts the first metal layer of the etch mask, has a different composition than the first metal layer of the etch mask and is spaced from the metal base; and

the routing line includes first and second metal layers, the first metal layer of the routing line contacts the second surface of the metal base and has a different composition than the metal base, and the second metal layer of the routing line contacts the first metal layer of the routing line, has a different composition than the first metal layer of the routing line and is spaced from the metal base.

356. (New) The method of claim 355, wherein the metal base and the second metal layers have similar compositions.

357. (New) The method of claim 356, wherein the metal base and the second metal layers are copper, and the first metal layers are nickel.

358. (New) The method of claim 356, wherein etching the metal base includes applying a wet chemical etch that is highly selective of the metal base and the second metal layers with respect to the first metal layers, thereby forming the pillar, removing the second metal layer of the etch mask and exposing the first metal layer of the routing line without removing the second metal layer of the routing line.

359. (New) The method of claim 358, including applying a second wet chemical etch after forming the pillar that is selective of the first metal layers, thereby removing the etch mask,

removing an exposed portion of the first metal layer of the routing line and exposing the first surface of the pillar.

360. (New) The method of claim 359, wherein applying the second wet chemical etch occurs before mechanically attaching the chip to the routing line and the pillar.

361. (New) A method of making a semiconductor chip assembly, comprising:

providing a metal base, an etch mask and a routing line, wherein the metal base includes first and second opposing surfaces, the etch mask is formed on the first surface of the metal base and the routing line is formed on the second surface of the metal base; then

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar faces in a first direction, the second surface of the pillar faces in a second direction opposite the first direction, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line in the first direction, and the routing line extends laterally from the pillar towards the chip;

forming an encapsulant that covers the chip, the routing line and the pillar and extends vertically beyond the chip, the routing line and the pillar in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant;

removing a portion of the encapsulant, thereby exposing the first surface of the pillar such that the chip and the pillar remain embedded in the encapsulant; and

forming a connection joint that electrically connects the routing line and the pad, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

362. (New) The method of claim 361, wherein forming the encapsulant includes transfer molding the encapsulant.

363. (New) The method of claim 361, wherein forming the encapsulant includes curing the encapsulant.

364. (New) The method of claim 361, wherein removing the portion of the encapsulant includes applying a laser that ablates the encapsulant.

365. (New) The method of claim 361, wherein removing the portion of the encapsulant includes applying a plasma that etches the encapsulant.

366. (New) The method of claim 361, wherein removing the portion of the encapsulant includes grinding the encapsulant.

367. (New) The method of claim 366, wherein removing the portion of the encapsulant includes grinding the encapsulant without grinding the pillar, and then grinding the encapsulant and the pillar, and excludes grinding the chip.

368. (New) The method of claim 366, wherein removing the portion of the encapsulant includes grinding the encapsulant without grinding the pillar and without grinding the chip, and then grinding the encapsulant, the pillar and the chip.

369. (New) The method of claim 368, wherein removing the portion of the encapsulant includes grinding the encapsulant without grinding the pillar and without grinding the chip, then grinding the encapsulant and the pillar without grinding the chip, and then grinding the encapsulant, the pillar and the chip.

370. (New) The method of claim 368, wherein removing the portion of the encapsulant includes grinding the encapsulant without grinding the pillar and without grinding the chip, then grinding the encapsulant and the chip without grinding the pillar, and then grinding the encapsulant, the pillar and the chip.

371. (New) A method of making a semiconductor chip assembly, comprising:

providing a metal base, an etch mask and a routing line, wherein the metal base includes first and second opposing surfaces, the etch mask is formed on the first surface of the metal base and the routing line is formed on the second surface of the metal base; then

mechanically attaching the metal base, the etch mask and the routing line to a support using an insulative base, wherein the insulative base contacts and is sandwiched between the metal base and the support, and between the routing line and the support; then

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar faces in a first direction, the second surface of the pillar faces in a second direction opposite the first direction, the chip overlaps the insulative base and the support and extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line in the first direction, the routing line extends laterally from the pillar towards the chip, the insulative base extends vertically beyond the chip, the routing line and the pillar in the second direction, and the support extends vertically beyond the insulative base in the second direction;

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant;

removing the support after forming the encapsulant; and

forming a connection joint that electrically connects the routing line and the pad, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

372. (New) The method of claim 371, wherein mechanically attaching the metal base, the etch mask and the routing line to the support includes contacting the insulative base to the metal base and the routing line, then contacting the insulative base to the support, and then curing the insulative base.

373. (New) The method of claim 371, wherein mechanically attaching the metal base, the etch mask and the routing line to the support includes contacting the insulative base to the support, then contacting the insulative base to the metal base and the routing line, and then curing the insulative base.

374. (New) The method of claim 371, wherein mechanically attaching the chip to the routing line and the pillar includes using an insulative adhesive that contacts and is sandwiched between the chip and the insulative base.

375. (New) The method of claim 371, wherein mechanically attaching the chip to the routing line and the pillar occurs after removing the etch mask.

376. (New) The method of claim 371, wherein mechanically attaching the chip to the routing line and the pillar occurs while forming the connection joint.

377. (New) The method of claim 371, wherein removing the support includes etching the support.

378. (New) The method of claim 371, wherein removing the support includes peeling-off the support.

379. (New) The method of claim 371, wherein removing the support occurs before forming the connection joint.

380. (New) The method of claim 371, wherein removing the support occurs after forming the connection joint.

381. (New) A method of making a semiconductor chip assembly, comprising:

providing a metal base, an etch mask and a routing line, wherein the metal base includes first and second opposing surfaces, the etch mask is formed on the first surface of the metal base and the routing line is formed on the second surface of the metal base; then

forming an insulative base that contacts the metal base and the routing line; then

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar using an insulative adhesive that contacts and is sandwiched between the chip and the insulative base, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar and the second surface of the chip face in a first direction, the first surface of the chip and the second surface of the pillar face in a second direction opposite the first direction, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line in the first direction, the routing line extends laterally from the pillar towards the chip, the adhesive extends vertically beyond the chip in the second direction, and the insulative base extends vertically beyond the adhesive in the second direction; then

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant; then

forming a through-hole that extends through the insulative base and the adhesive and exposes the pad; and then

forming a connection joint that electrically connects the routing line and the pad, wherein a conductive trace that includes the routing line and the pillar is electrically connected to the pad and extends through the first surface of the encapsulant.

382. (New) The method of claim 381, wherein forming the through-hole includes applying a laser that ablates the insulative base and the adhesive.

383. (New) The method of claim 381, wherein forming the through-hole includes applying a plasma that etches the insulative base and the adhesive.

384. (New) The method of claim 381, wherein forming the through-hole exposes the routing line, and the connection joint contacts the routing line in the through-hole.

385. (New) The method of claim 384, wherein forming the connection joint includes electroplating the connection joint on the routing line and the pad.

386. (New) The method of claim 384, wherein forming the connection joint includes electrolessly plating the connection joint on the routing line and the pad.

387. (New) The method of claim 384, wherein forming the connection joint includes depositing solder paste on the routing line and the pad and then reflowing the solder paste.

388. (New) The method of claim 384, wherein forming the connection joint includes depositing conductive adhesive on the routing line and the pad and then curing the conductive adhesive.

389. (New) The method of claim 381, wherein forming the through-hole does not expose the routing line, and the connection joint does not contact the routing line in the through-hole.

390. (New) The method of claim 389, wherein forming the connection joint includes providing a wire bond that extends into and is electrically connected to the pad in the through-hole, and extends out of and is electrically connected to the routing line outside the through-hole.

391. (New) A method of making a semiconductor chip assembly, comprising:

providing a metal base, an etch mask and a routing line, wherein the metal base includes first and second opposing surfaces, the etch mask is formed on the first surface of the metal base and the routing line is formed on the second surface of the metal base; then

etching the metal base, wherein an unetched portion of the metal base defined by the etch mask forms a pillar that includes first and second opposing surfaces, the first surface of the pillar faces away from the routing line and contacts the etch mask, and the second surface of the pillar contacts the routing line; then

mechanically attaching a semiconductor chip to the routing line and the pillar, wherein the chip includes first and second opposing surfaces, the first surface of the chip includes a conductive pad, the first surface of the pillar faces in a first direction, the second surface of the pillar faces in a second direction opposite the first direction, the chip extends vertically beyond the routing line in the first direction, the pillar is disposed outside a periphery of the chip and extends vertically beyond the routing line in the first direction, and the routing line extends laterally from the pillar towards the chip; then

forming an encapsulant that covers the chip and extends vertically beyond the chip and the routing line in the first direction, wherein the encapsulant includes a first surface that faces in the first direction and a second surface that faces in the second direction, and the chip and the pillar are embedded in the encapsulant; and then

forming a connection joint that contacts and electrically connects the routing line and the pad and a first terminal that contacts the first surface of the pillar, extends vertically beyond the pillar in the first direction and is spaced from the connection joint during a plating operation, wherein a conductive trace that includes the routing line, the pillar and the first terminal is electrically connected to the pad and extends through the first surface of the encapsulant.

392. (New) The method of claim 391, wherein forming the connection joint and the first terminal includes simultaneously forming the connection joint and the first terminal during the plating operation.

393. (New) The method of claim 391, wherein forming the connection joint and the first terminal includes forming a second terminal that contacts the routing line, extends vertically beyond the routing line in the second direction and is spaced from the connection joint and the first terminal during the plating operation.

394. (New) The method of claim 393, wherein forming the connection joint and the first and second terminals includes simultaneously forming the connection joint and the first and second terminals during the plating operation.

395. (New) The method of claim 393, wherein the first and second terminals are vertically aligned with one another.

396. (New) The method of claim 393, wherein the first and second terminals are not vertically aligned with one another.

397. (New) The method of claim 391, wherein the first surfaces of the pillar and the encapsulant are laterally aligned with one another, and the first terminal extends vertically beyond the encapsulant in the first direction.

398. (New) The method of claim 393, wherein the second terminal extends vertically beyond the encapsulant in the second direction.

399. (New) The method of claim 391, including forming a first solder ball on the first terminal.

400. (New) The method of claim 393, including forming a first solder ball on the first terminal and a second solder ball on the second terminal.